

### **REMARKS**

This responds to the Office Action mailed on May 19, 2004.

Claims 12 and 15 are amended, no claims are canceled, and claims 25–27 are added; as a result, claims 1–18 and 25–27 are now pending in this application.

#### **Claim Objection**

Claim 15 was objected to due to informalities. It is believed that the amendment made herein to claim 15 obviates said objection.

#### **§112 Rejection of the Claims**

Claim 12 was rejected under 35 USC § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Claim 12 was amended to be dependent upon claim 10, rather than claim 1, in order to provide a proper antecedent basis for all of the features of claims 12 and 13.

#### **§103 Rejection of the Claims**

##### **The rejections**

A. Claims 1, 2 and 5–15 were rejected under 35 USC § 103(a) as being unpatentable over Yaniv et al. (U.S. 6,312,303) in view of Neugebauer et al. (U.S. 5,102,824) (hereinafter “Neugebauer”). Applicants respectfully traverse the rejection for the reasons stated below.

B. Claims 3 and 4 were also rejected under 35 USC § 103(a) as being unpatentable over Yaniv et al. in view of Neugebauer et al., and further in view of Marra et al. (U.S. 5,972,265) (hereinafter “Marra”). Applicants respectfully traverse the rejection for the reasons stated below.

C. Claims 16–18 were also rejected under 35 USC § 103(a) as being unpatentable over Yaniv et al. in view of Marra et al. Applicants respectfully traverse the rejection for the reasons stated below.

Yaniv et al. (U.S. 6,312,303)

Yaniv relates to a method for aligning nanotubes deposited on a cathode to achieve good electron field emission.<sup>1</sup> It relates to a method where the nanotubes are placed with a host phase of ordered elongated particles.<sup>2</sup> in a host phase of a material that has molecules that will align under an electric field. Although Yaniv discusses a liquid crystal host phase which includes an ultraviolet curable binder that hardens the liquid crystal when exposed to UV light<sup>3</sup>, it is the “alignment of the host phase in the specific direction [which] induces alignment of the nanotubes disposed within the host phase”.<sup>4</sup> When the host molecules are aligned, they eventually cause the carbon nanotube fibers to become aligned in the same direction<sup>5</sup>. Yaniv teaches that it is necessary to include elongated particles such as liquid crystal molecules with a mixture of nanotubes in order to align the nanotubes indirectly; by having them aligned by aligning the particles of the host phase.

Neugebauer et al. (U.S. 5,102,824)

Neugebauer relates to a method of manufacturing a distributed light emitting diode flat screen display for use in televisions.<sup>6</sup> It relates to electrically aligning light emitting diode slivers in a curable optical epoxy.<sup>7</sup> Neugebauer explains that “electric field acts to identically align the dipole slivers because PN junctions have an intrinsic dipole moment.”<sup>8</sup> The Office Action does not contend that Neugebauer shows or suggests that the method for aligning light emitting diode slivers in a curable optical epoxy is applicable to aligning carbon nanotubes in a liquid polymer as claim 1 requires.

Marra (U.S. 5,972,265)

Marra is a system for producing a composite material from wood particles 102 and a binder 104 dispensed from spray nozzles 34. Again, the Office Action is silent as to how the criteria for making a *prima facie* case of obviousness is asserted to be met by evidence in Maara, Neugebauer, Yaniv or elsewhere in the prior art.

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<sup>1</sup> Yaniv, Col 1, lines 9–11.

<sup>2</sup> Yaniv, Col 2, lines 19–21.

<sup>3</sup> Col 2, lines 28–33.

<sup>4</sup> Col 2, lines 65–67.

<sup>5</sup> Yaniv, *supra*, Col 2 lines, lines 45–50.

<sup>6</sup> Neugebauer, Title, Abstract,

<sup>7</sup> Neugebauer, col 3 lines 16–20, col 5, lines 29–31.

<sup>8</sup> Neugebauer col 5, lines 19–23.

The Criteria for Combining References in an Obviousness Rejection Have Not been Met<sup>9</sup>.

A proper obviousness rejection must show a *prima facie* case of obviousness. The Office Action combines material from Neugebauer and Yaniv et al<sup>10</sup> without satisfying the three basic criteria for establishing a *prima facie* case of obviousness<sup>11</sup>. To do meet the criteria the Office Action must demonstrate that some objective teaching in the prior art or some knowledge generally available to one of ordinary skill in the art would lead an individual to combine the relevant teaching of the cited patents. No showing was made in the Office Action as to where there is evidence that one skilled in the art would combine Yaniv and Neugebauer in any manner, much less in the specific manner that the Office Action proposed. An Office Action must provide specific, objective evidence of record for a finding of a suggestion or a motivation to combine reference teachings and must explain the reasoning by which that evidence is deemed to support such a finding.<sup>12</sup>

Response to Rejection A

In Section 6 of the Office Action as to claims 1, 2 and 5–15 the sole explanation in the Office Action as to why the references ought to be combined in a rejection of those claims is both conclusory and unintelligible:

“The subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified YANIV’S teachings as shown by NEUGEBAUER because NEUGEBAUER discloses that particles are both fix the particles in the host phase by curing with or without the influence of the electric field.”<sup>13</sup>

Applicant does not admit that Yaniv is prior art, and reserves the right to swear behind it at a later date. Nevertheless, Applicant respectfully submits that the obviousness rejection based upon the combination of Yaniv and the other cited documents fails to make a *prima facie* showing of obviousness of the rejected claims.

Yaniv et al relates to field emission displays with carbon nanotubes which are placed “with a host phase of ordered elongated particles.”<sup>14</sup> The carbon nanotubes are aligned “by

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<sup>9</sup> Set forth in MPEP 2143

<sup>10</sup> Manna is also combined with Neugebauer and Yaniv in some claim rejections.

<sup>11</sup> Set forth in MPEP 2143

<sup>12</sup> *In re Sang Su Lee*, 277 F 3d 1338, 61 USPQ2d 1430 (Fed. Cir. 2002)

<sup>13</sup> Office Action, page 4, lines 12–16

<sup>14</sup> Yaniv, Col 2, lines 18–21.

aligning the particles of the host phase.<sup>15</sup> Yaniv does not show aligning the nanotubes “by applying an electrostatic field” as claims 1, 2 and 12–15 require.

Neugebauer relates to alignment of multiple light emitting diode slivers in an uncured optical epoxy by applying an electric field. The mechanism for accomplishing the alignment of the slivers is explained in Neugebauer to be that the “electric field acts to identically align the light emitting diode slivers because PN junctions have an intrinsic dipole moment.”<sup>16</sup> Once the slivers are aligned, Neugebauer states that host phase is cured. No explanation is given in the Office Action of why one interested in aligning nanotubes in Yaniv would look to Neugebauer and its method of aligning dipole slivers with an electric field.

#### Response to Rejection B

In the second paragraph of Section 6 of the Office Action as to claims 2, 10 and 11, the Office Action merely states “YANIV discloses the subject matters in Fig. 7.”<sup>17</sup> While Yaniv Fig. 7 relates to a process for aligning nanotubes for a field emission display, it does not show “forming a thermal intermediate structure” as claim 2 requires. Neither does Neugebauer show “forming the composite into a billet” as claim 10 requires as provided in claim 9 from which it depends. Nor does Neugebauer show the specific capacitor plate geometric limitations of claim 11.

In the third paragraph of Section 6 of the Office Action as to claims 12 and 15 the Office Action Asserts that “...the step of adjusting the spacing would have been within the level of ordinary skill in the art because the step is necessary in the producing of the final product within a specified specification”<sup>18</sup>. Applicant notes that both claims now depend from claim 6 and that the Office Action does not suggest that there is support in either Yaniv or Neugebauer for a method which includes the claim element from claim 6 of “...immersing at least a portion of a parallel plate capacitor in the composite”<sup>19</sup>. Combining the cited patents in the manner proposed in the Office Action does not supply that missing element which is not shown in either cited patent.

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<sup>15</sup> Yaniv, Col 2, lines 26–27

<sup>16</sup> Neugebauer, Col 5 lines 19–22.

<sup>17</sup> Office Action, page 4, lines 17–18

<sup>18</sup> Office Action, page 5, lines 1–4.

<sup>19</sup> See Applicants claim 6 upon which amended claim 12 and claim 6 depend.

Applicants also respectfully traverse the rejection since it asserts what the Examiner asserts was “within the level of ordinary skill in the art” appears to be based upon facts within the personal knowledge of the Examiner. Applicant respectfully requests the Examiner to provide a reference that supports the assertion. Absent such a reference, it appears that the Examiner is using personal knowledge, so the Examiner is respectfully requested to submit an affidavit as required by 37 C.F.R. § 1.104(d)(2).

In Section 7 of the Office Action, claims 3 and 4 were rejected on the combination of Yaniv and Neugebauer discussed above and further in view of Marra. The Office Action did not attempt to satisfy any of the MPEP 2143 criteria that are to be satisfied as a precondition to combining patents in an obviousness rejection. Furthermore even if one were to overlook the fact no evidence has been pointed to in the Office Action which provides a evidence of a motivation to combine Maara with Yanav and Neugebauer, none of the cited patents shows “dispensing the slurry onto a surface of a continuous conveyor” combined with “applying an electrostatic field to the layer of unaligned carbon nanotube composite” as claim 3 requires or carrying out those steps “while the continuous conveyor is moving the composite” as claim 4 requires.

#### Response to Rejection C

In Section 7 of the Office Action, claims 16–18 were rejected for the reasons set forth in Section 7 of the Office Action. Applicant submits that those claims are patentable for the same reasons stated in response to the Rejection made in Section 7 of the Office Action.

Applicants request reconsideration and allowance of all of the claims in view of the above remarks and further reasons.

Conclusion

Applicants respectfully submit that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney ((612) 373-6970) to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: MS Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this 17th day of November, 2004

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